CONCENTRATION ELECTIVE OPTIONS

All BME students must complete a minimum of 12 credits of Concentration Electives in order to satisfy the requirements for the Bachelor of Science. These Concentration Electives are typically completed in the senior year, though they may be taken as a junior as long as all prerequisite courses have been completed. Specific sets of Concentration Electives have been approved for each of the undergraduate concentrations. If students have an interest in other courses that are not on these lists, they may request approval of those courses through their Concentration Plan (see below). This includes courses offered at other institutions that may be taken as a guest student while on an out-of-town placement.

Students who are interested in maximizing the use of AGRADE credits towards an MS degree should select 5000-level courses for their Concentration Electives. Honors students MUST include BE 5998 (minimum of 3 credits) as one of their Concentration Electives.

In order to guarantee that ABET requirements regarding minimum numbers of Engineering credits are met, at least 4 credits of Concentration Electives must be in an engineering course. With some minor exceptions, students can assume that courses offered by Engineering departments have sufficient engineering content to be considered an engineering course.

Prior to registration for senior year courses, each student should file a Concentration Plan with the Undergraduate Program Chair. This Plan will list the student’s career and educational goals, anticipated Concentration Electives, and a brief description of how the selected courses support the post-graduation goals. NOTE: Students should pay attention to listed course prerequisites in developing their Concentration Plans.

All Concentrations

- BE 5998 – Honors Thesis (3-4 cr)
- BME 5020 – Computer and Mathematical Applications in Biomedical Engineering (4 cr)
- BME 5070 – Engineering Anatomy (4 cr)
- BME 5900 – National Design Competition (var)¹
- BME 5990 – Directed Study (var)¹
- BME 5995 – Molecular Imaging & Biology (4 cr)
- BME 6500 – Enabling Technology (4 cr)
- BE 5998 – Honors Thesis (3-4 cr)
- IE 4260 – Principles of Quality Control (3 cr)
- IE 4450 – Concurrent Engineering Design (4 cr)
- IE 6240 – Quality Management (4 cr)
- IE 6260 – Quality Assurance and Control (2 cr)
- IE 6405 – Integrated Product Development (4 cr)
- IE 6610 – Introduction to Six Sigma (4 cr)
- IE 6840 – Project Management (2 cr)

¹ For the class of 2016 and beyond, a minimum of 6 credits of Engineering credits must be included in the 16 credits of Directed and Concentration Electives.
Biomaterials
- BME 5380 – Biocompatibility (4 cr)
- BME 5390 – Experimental Methods in Biomaterials (2 cr)
- BME 5995 – Cell & Tissue Biomechanics (4 cr)
- CHE 5995 – Intro to Nano Medicine & Nano Technology (3 cr)
- MSE 5350 – Polymer Science (4 cr)
- MSE 5360 – Polymer Processing (4 cr)
- MSE 5600 – Composite Materials (4 cr)
- CHM 5600 – Biochemistry (3 cr)

Biomechanics
- BME 5130 – Vehicle Safety Engineering (3 cr)
- BME 5210 – Musculoskeletal Biomech (4 cr)
- BME 5995 – Cell & Tissue Biomechanics (4 cr)
- BME 6130 – Accident Reconstruction (3 cr)
- KIN 3570 – Physiology of Exercise (3 cr)
- KIN 3580 – Biomechanics (3 cr)
- KIN 6310 – Physiology of Exercise II (3 cr)
- IE 4120 – Intro to Human Factors Engg (4 cr)
- ME 3400 – Dynamics (3 cr)
- ME 5040 – Finite Element Analysis I (4 cr)
- ME 5360 – Intro to Computational Biofluidics and Heat Transfer (4 cr)
- ME 5400 – Dynamics II (4 cr)
- ME 5580 – Computer-Aided Mech Design (4 cr)
- ME 5600 – Adv Mechanics of Materials (4 cr)
- ME 5610 – Experimental Mech of Materials (4 cr)
- ME 5720 – Mech of Composite Materials (4 cr)

Biomedical Instrumentation
- BME 5510 – Intro to Clinical Engineering & Technology (2 cr)
- BME 5530 – Mechatronic System Design I (4 cr)
- BME 5540 – Mechatronic System Design II (4 cr)
- BME 5730 – Application Techniques in Biomed Image Processing (3 cr)
- BME 6470 – Smart Sensor Tech I: Design (4 cr)
- BME 6480 – Biomedical Instrumentation (4 cr)
- CSC 5860 – Intro to Digital Image Proc (3 cr)
- CSC 6860 – Digital Image Proc & Analysis (3 cr)
- ECE 3330 – Circuits II (4 cr)
- ECE 3570 – Electronics I (4 cr)
- ECE 3620 – Intro to Microcomputers (4 cr)
- ECE 4050 – Algorithms & Data Structures (4 cr)
- ECE 4330 – Linear Network & System Analysis (4 cr)
- ECE 4340 – Microcomputer-Based Instrumentation Lab (2 cr)
- ECE 4570 – Electronics II (4 cr)
- ECE 5575 – Introduction to Micro and Nano Electro Mechanical Systems (4 cr)
- ECE 5690 – Intro to Digital Image Processing (4 cr)
- ECE 5770 – Digital Signal Processing (4 cr)
- PHY 5340/5341 – Optics Lecture + Lab (5 cr)
- RAD 5010 – Intro to Radiological Physics (4 cr)

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